PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

DINI, Roberto
MERLONI ELETTRODOMESTICI SpA
Ufficio Brevetti e Marchi
Via Pinerolo 25
I-10060 NONE (TO)
ITALIE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	19.06.00
Applicant's or agent's file reference	IMPORTANT NOTIFICATION
ME010	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB99/00302	18/02/1999	20/02/1998

Applicant
MERLONI ELETTRODOMESTICI S.P.A. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Garvey, R Tel. +49 89 2399-2271

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 13 October 1999 (13.10.99)	
International application No. PCT/IB99/00302	**Applicant's or agent's file reference** ME010
International filing date (day/month/year) 18 February 1999 (18.02.99)	**Priority date** (day/month/year) 20 February 1998 (20.02.98)
Applicant AISA, Valerio	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

10 September 1999 (10.09.99)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer S. Mafla
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

management of information associated with the various household users. In this frame, several proposals are already known, which are based on the use of control and supervision systems or devices for the household users, all of them characterized in that:

- they perform automatic activity, even if against an appropriate operation by the utilizer or customer for their starting configuration;
- they are classed at a hierarchical higher level compared to the household users level, i.e developing an active control, with a *master* role, over them.

A fully alternative solution to such a "centralized" control and supervision approach of household users is disclosed in the European Patent Application EP-A-0 727 668, filed by the same Applicant hereto.

Such a document describes a set of household appliances capable of constantly receiving information concerning the total power absorption of all household users (household appliances, illumination system, air conditioning system, etc.), concerning the maximum usable power (power supply contract), the current time (clock function) and the likely different electricity cost according to variable use hours rates.

Such information are supplied by a special external sensor, which may be the same electric meter developed to that purpose, or an alternative device specifically provided. The means whereto such information are flowing may be of different type; however, the *power line* is a preferable one, i.e. the electric network itself, since there is no need for additional wiring

The set of household appliances described in EP-A-0 727 668, each one equipped with a suitable electronic control system and adequate interfacing means to the network, is able to limit its own electric power consumption "spontaneously" and automatically, so as to maintain the total consumption of the whole household environment constantly below the limit established in the power supply agreement, requiring neither an external centralized supervision system nor any operation by the utilizer.

The present invention is based on the acknowledgment of the fact that in such a system of "smart" household appliances connected in a network, it would be useful for the utilizer and/or anybody charged with their maintenance to be informed of the operation status of the

CLAIMS

1. System for monitoring a plurality of electric users (C), in particular household appliances, belonging to a same household environment and connected to a network (R), said electric users (C) comprising each one an electronic control system with interface means to said network (R), each electronic control means being programmed to send onto said network (R), through said interface means, information related to operating conditions of the relevant electric user (C), characterized in that a monitoring device (F) connected to said network (R) is provided, which comprises first means (N,I,MP) for selecting and picking up data available on said network (R) and second means (MP,V,K,L,M) for organizing and making explicit to the outside the data selected and picked up from said network (R).

2. System, according to claim 1, characterized in that said monitoring device (F) comprises memory means for storing the data selected and picked up from said network (R) and that said second means (MP,V,K,L,M) are apt to manage the making explicit of the data stored in said memory means (ME).

3. System, according to claim 2, characterized in that said first and/or second means (MP,V,K,L,M) comprise a microcontroller (MP).

4. System, according to claim 2, characterized in that said memory means (ME) are of the nonvolatile type, but updatable.

5. System, according to claim 1, characterized in that said second means (MP,V,K,L,M) comprise a display device (V) to make said information explicit at local level, directly to the utilizer.

6. System, according to claim 1 or 2, characterized in that said second means (MP,V,K,L,M) are apt to manage and make said data explicit at a level being remote with respect said monitoring device (F).

7. System, according to claim 6, characterized in that said second means (MP,V,K,L,M) are apt to manage and make said data explicit at a remote level outside the household environment, for instance to a special customer service and maintenance center

(H) for said plurality of electric users (C).

8. System, according to claim 5 or 6, characterized in that said second means (MP,V,K,L,M) comprise interaction means (K) for selecting the type of data to be made explicit at local level and/or remote level.

9. System, according to claim 5 or 6, characterized in that said second means (MP,V,K,L,M) comprise interaction means (K) for activating and revealing or transmitting said data at a remote level.

10. System, according to claim 7, characterized in that said second means (MP,V,K,L,M) comprise a modem apt to be connected to a telephone line through an appropriate connection system (L).

11. System, according to claim 7, characterized in that said second means (MP,V,K,L,M) are apt to manage and make explicit or transmit said data at remote level through the Internet communication network, for sending said information to a remote site.

12. System, according to claim 7, characterized in that said second means (MP,V,K,L,M) are apt to make explicit or transmit said data at remote level outside said household environment through a telephone, in particular a cordless or mobile telephone (T), which is interfaced with said monitoring device (F) through an appropriate connection systems (M).

13. System, according to at least one of the previous claims, characterized in that said data are of a first type, concerning the current operation mode of each of said electric users (C), such operation mode being expressed through the value of a set of parameters and/or physical values characterizing the operation status of each user (C).

14. System, according to at least one of the previous claims, characterized in that said data are of a second type, concerning the operation quality of each of said electric users (C), said operation quality being expressed through the value of a set of diagnostic parameters typical of each user (C).

15. System, according to at least one of the previous claims, characterized in that said data are of a third type, concerning the operation statistical data of each of said electric

users (C), said operation statistical data forming in particular the history of each user from the viewpoint of the performed operations and/or functions, from the viewpoint of the usage procedure by the utilizer and revealing the wear status of determined components related to each of said electric users (C).

16. System, according to claim 8 or 9, characterized in that said interaction means (K) allow for the selection of the type of data to be transmitted or made explicit at remote level outside said household environment, the mode for their transmission and the relevant time interval.

17. System, according to claim 1, characterized in that said network (R) is connected to a source of information (A,B) on the total absorption of electric power in the household environment and on the value of the contractual power, i.e. the maximum electric power which can be used, based on a power supply contract, said source of information consisting in particular of a power meter (A) of said household environment or of an appropriate measuring device (B) located downstream a power meter (A) of said household environment.

18. System, according to claim 1, characterized in that said network (R) consists of the same electric supply network of the household environment and that said information are sent to said network (R) with the conveyed-waves technique, in particular with FSK (Frequency Shift Keying) or AFK (Amplitude Shift Keying) modulation, the flow of said information being ruled by appropriate protocols apt to warrant a non conflictual sharing of said network (R) among said electric users (C) in relationship with said monitoring device (F), and other likely users available in said household environment.

19. System, according to claim 1, characterized in that said electric users (C) are represented by the users of a kitchen environment consisting of the totality or a part of the following household appliances: refrigerator (C2), freezer (C5), dishwasher (C2), oven (C1), cooking hob (C6), exhaust hood (C7), laundry washer (C4), boiler.

20. System, according to claim 1, characterized in that at least a part of said household appliances (C1,C2,C3,C4,C5,C6,C7) are of the built-in type, i.e. incorporated in,

or associated with, pieces of furniture of a kitchen environment.

21. System, according to claim 1 or 20, characterized in that said network, to which said electric users or built-in household appliances (C1,C2,C3,C4,C5,C6,C7) and said monitoring device (F) are connected, consists of a cable with at least two wires, that the communication between said appliances (C1,C2,C3,C4,C5,C6,C7) and said monitoring device (F) is of the serial type and that the communication system of said information is of the multi-point type managed by an appropriate protocol.

22. System, according to claim 21, characterized in that

- an information source (A,B) is provided, apt to admit to the electric supply network (R) of the household environment information related to a total absorption of electric power of the whole household environment and to the value of the power supply contract, i.e. the maximum electric power which can be used according to a supply contract,
- said monitoring device (F) is connected to said electric supply network (R) and is apt to constantly inform through said cable with at least two wires the control systems of said electric users or household appliances (C), of the value of the residual power available, obtained as a difference between the value of the power supply contract and the total absorbed power.

23. System, according to claim 17 or 22, characterized in that the electronic control system of each of said electric users or household appliances (C) is programmed to self-limit its own absorption of electric power, according to the difference between the value of the contractual power and the total absorbed power and according to appropriate priority criteria encoded in said control systems, with the aim that the value of the total power absorbed by the whole household environment will not exceed the value of the power supply contract, in particular to constantly avoid in an automatic manner any black-outs due to accidental power overabsorptions.

24. Device for monitoring a plurality of household appliances (C) belonging to a same household environment and connected to a network (R), where each of said appliances (C) comprises an electronic control system, said electronic control system of

each appliance (C) being programmed to make available on said network (R) information relating to the operating conditions of the relevant appliance (C), said monitoring device being characterized in that it comprises:

- interface means (I) to said network (R);
- means for selecting (K,MP) and picking up (N) data available on said network (R);
- means (MP,K) for organizing and eventually storing (ME) the data selected and picked up from said network (R);
- means to manage the making explicit (MP,V,L,M,R) of the data selected, picked up and eventually stored.

25. Device, according to claim 24, characterized in that it is either movable or portable, specifically apt to be carried to any place of the household environment where a power socket is available.

26. Device, according to claim 24, characterized in that it is associated, as a fixed element, with a set of electric users belonging to a homogeneous context of the household environment.

27. Device, according to claim 26, characterized in that said homogeneous context is represented by a kitchen environment.

28. Device, according to claim 27, characterized in that it is integrated in the kitchen furniture and represents a typical element of such an environment, to be adapted to the style of the kitchen itself and/or associated with the correspondent trade-mark of the furniture supplier.

29. Device, according to at least one of the previous claims, characterized in that it is self-installing, i.e. requiring no operation by the utilizer not even during installation

30. Device, according to at least one of the previous claims, characterized in that it comprises a buffer battery.

31. Method for monitoring a plurality of electric users (C), in particular household appliances belonging to a same household environment and connected to a network (R), where each of said electric users (C) comprises an electronic control system with interface

means to said network (R), and each electronic control system is programmed to make available on said network (R) information relating to the operation conditions of the relevant appliance (C), said monitoring method being characterized in that it provides for the following steps:

- selecting and picking up, through a monitoring device (F), the data available on said network (R), the monitoring device (F) being interfaced with said network (R);
- organizing, by means of said monitoring device (F), the data selected and picked up, and their likely storing in suitable memory means (ME) contained in said device (F);
- making explicit, through said monitoring device (F), the data that have been selected, picked up and eventually stored.

32. Method, according to claim 31, characterized in that said data are made explicit at local level within the household environment.

33. Method, according to claim 31, characterized in that said data are made explicit or transmitted at remote level, i.e. outside the household environment.

34. Method, according to claim 33, characterized in that said data are transmitted to a service and/or preventive maintenance center (H) for said electric users (R).

35. Method, according to claim 31, characterized in that said data are of a first type, concerning the current operating mode of each of said electric users (C), said operating mode being expressed through the value of a set of parameters and/or physical quantities characterizing the operation status of each users (C).

36. Method, according to claim 31, characterized in that said data are of a second type, concerning operation quality of each of said electric users (C), said operation quality being expressed through the value of a set of diagnostic parameters typical of each user (C).

37. Method, according to claim 31, characterized in that said data are of a third type, concerning statistical information of operation of each of said electric users (C), said operation statistical data forming in particular the history of each user both from a viewpoint of the performed operations and/or functions and the viewpoint of usage procedures by the user, and revealing the wear status of determined components related to

each of said electric users (C).

38. Method, according to at least one of the previous claims, characterized in that the selection is provided of the type of data to be made explicit at local level and/or remote level.

39. Method, according to at least one of the previous claims, characterized in that the selection is provided of the transmission procedure for said data at remote level and their relevant time interval.

40. Method, according to claims 34 and 36, characterized in that the service activity of said center (H) is based on said data of the second type.

41. Method, according to claims 34 and 37, characterized in that preventive maintenance activity of said center (H) is based at least on said data of the third type.

42. Method, according to claims 36 and/or 37, characterized in that the transmission at remote level of said data to said center (H) occurs either through a manual instruction or in automatic manner.

43. Method, according to the previous claim, characterized in that the transmission of said information to said center (H) is performed by the user through a direct phone call to a correspondent toll-free number.

44. Method, according to claims 36 and/or 37, characterized in that the control systems of said electric users (C) generate said data of the second type and/or said data of the third type, store them in their own memory means and update them in the time

45. Method, according to claim 44, characterized in that the control systems of said electric users (C) periodically make available on said network (R) the stored data of the second type and/or of the third type.

46. Method, according to claim 45, characterized in that said monitoring device (F) picks up from said network (R) said data of the second type and/or the third type, store them in its own nonvolatile memory means and transmit said stored data at a remote level

16

PATENT COOPERATION TREATY

REC'D 20 JUN 2000
WIPO PCT

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
ME010		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB99/00302	18/02/1999	20/02/1998
International Patent Classification (IPC) or national classification and IPC H02J13/00		
Applicant MERLONI ELETTRODOMESTICI S.P.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☐ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
10/09/1999	19.06.00
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Wilhelm, G Telephone No. +49 89 2399 2749

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB99/00302

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1,3-17	as originally filed			
2	as received on	22/05/2000	with letter of	19/05/2000

Claims, No.:

1-36	as received on	22/05/2000	with letter of	19/05/2000

Drawings, sheets:

1/1	as originally filed

2. The amendments have resulted in the cancellation of:

☐ the description, pages:
☒ the claims, Nos.: 37-47
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 1-36.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 1-36 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☒ the claims, or said claims Nos. 1, 20, 35 are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1. Reference is made to the following documents:

   D1: EP-A-0 727 668 (MERLONI ELETTRODOMESTICI SPA) 21 August 1996 cited in the application
   D2: US-A-4 602 340 (APPELBERG GUSTAF T) 22 July 1986
   D3: EP-A-0 727 860 (BOSCH SIEMENS HAUSGERAETE) 21 August 1996

Re item III

2. The present set of claims contains four (4!) independent claims, i.e. claim 1 (method for monitoring), claim 20 (system for monitoring), claim 35 (electric user) and claim 36 (monitoring device).

3. Independent claims 1 and 20 refer to "at least an electric user" whereas the original application constantly refers to "a plurality of electric users". The primary examiner was unable to find a support for this amendment; the requirements of Art.6 PCT are thus not met.

4. Claims 1, 20 and 35 define that the electronic control system of the/each electric user is programmed for generating and storing within its memory means at least diagnostic information and/or statistical information.

   According to the original specification 'each of said control systems ... is programmed to send onto said bus ... information related to the operation conditions of the household appliance. Said information are of various type and ... can be distinguished into functional, diagnostic and statistical information' (page 6, lines 13-17).
   According to page 7, lines 18-20 ' functional, diagnostic and statistical information. are generated by the individual household appliances C'.
   Referring to page 8, line 28 et seq., 'the control system of each household appliance C is programmed ... to periodically store at least the diagnostic and the functional information in its own memory means, and to update their contents in the time'.
   Page 12 indicates, diagnostic and statistical information is generated, stored and updated with time by the relevant control systems (lines 7/8 and 22-24).

The primary examiner was unable to find a support for the amendment to claims 1, 20 and 35; the requirements of Art.6 PCT are thus not met.

For seek of completeness, three further observation are made:
- at line 30 et seq. of page 2 it is stated that ' the present invention is based on the acknowledgement of the fact that in such a system of "smart" household appliances connected in a network, it would be useful ... **to be informed of the operation status** of the various household appliances, ... Therefore, it is the main aim of the present invention to provide a monitoring system allowing the utilizer **to verify** ... **the operation status of all "smart" appliances**. If the control system would not generate functional data, the aforementioned problem of monitoring the operation status of all smart appliances could not be solved;
- at lines 6-9 of page 2, the data acquired and stored by the monitoring system, i.e. device F is specified. One cannot deduct from this citation that the appliances only generate diagnostic and statistical data; and
- original claims 31 and 35-37 specify the type of data available on said network (cf. page 23, lines 5/6) rather than the information generated and stored by the control system of the electric appliances.

5. Moreover, claims 35 and 36 have to objected on the ground that they do not define the matter for which protection is sought. For instance, claims 1-19 pertain to a method and it is not clear which structural elements are defined by these steps and which elements are essential for the definition of the electric user and the monitoring device of claims 35 and 36, respectively.

6. Now referring to the applicant's observations and to prior art D2 and D3:

6.1 The examiner agrees that a generation and storage of diagnostic and statistical information (for the meaning of these terms see page 6 and 7) is not disclosed by D1.

6.2 The applicant admits that the TV set of D1 provides information relating to a current condition or function being performed by an appliance. It is however argued that it would make no sense to memorize the information that a cooking program has ended, or that the preservation time of a foodstuff has expired.

6.3 The point was already made by the primary examiner that in **D1** some domestic electric appliances 'can send on the "bus" information being useful for the user and which can be shown on a TV set: for example, the oven FO can communicate the end of a cooking process, ..., and so on' (cf. col. 11, ls. 1-8).
Therefore, the TV set of D1 can be considered as monitoring device which is connected to said network and which comprises means for selecting and picking up data available on said network and second means for organizing and making explicit to the outside the data selected and picked up from said network. In other words, the monitoring device of D1 does not pick up and display every piece of information available on said network, e.g. remote control signals of a power plant. Since the monitoring device according to D1 is apt to display data of various household appliances, the device must be able to store at least temporarily the data selected and picked up from the network and to manage (organise, format) these data for displaying.
For instance, indication of the deadline for the maximum preservation period of a certain foodstuff implies that the freezer sends a unique signal (e.g. date of expiry, indication of item, name) on the network. It is not very likely that the freezer directly controls the CRT. The unique freezer signal is recognized by the TV set, it is transformed/formatted into signals for controlling the CRT to present the freezer signal in an understandable, human visible form for a predetermined period of time (cf. video-text information available on TV).

6.4 The applicant commented on document **D2** by saying that the combination of documents D1 and D2 could (only) lead the skilled man to realize a monitoring system in which an appliance sends, during the execution of an operating program or cycle, the functional information generated by its control system to a remote location, which had nothing to do with the present invention.

The examiner agrees that the generation and storage of diagnostic and statistical information by the control system is not explicitly mentioned.

On the other hand, the abstract of D2 specifies a system 'for distributing ... information signals through the electrical grid-work of a facility such as a home, ... for purposes of information display and/or control and monitoring of equipment and activities thereof' (cf. also col.2, ls.3-11).

Column 4, line 61 - column 5, line 18 starts by stating: '... time employing devices 20 ... would include controlling devices such as ... household devices, etc. that recognize and use the coded time signal directly in the facility. The time employing devices may range from simple to that of a microprocessor. Their functions vary greatly. In general, they serve to acquire data, **analyze data** or control systems. ... Any physical phenomenon can be of interest and as such may be used to generate signals of interest to the monitor' (cf. also col.4, ls.46-52).
Columns 7, ls.6 et seq. state some advantages achieved by this system: ...
(c) as a means for reporting of frequencies of occurrences or events, or cycles of operations in remote locations.
The last citation clearly hints at the generation of **statistical information** of the kind set out in the application on page 7, lines 12-18.

6.5 For seek of completeness document **D3** is briefly discussed. This document concerns a system for controlling and monitoring of household appliances and hints clearly at the generation of **diagnostic information** (cf. col.3, ls.1-13). Abnormal behaviour is detected by comparison of appropriate signals e.g. for a freezer until defrost-activity is indicated (cf. "extended open-door status" mentioned in the application on page 7, line 4).

6.6 The teaching of D2 and D3 is therefore highly relevant for the assessment of inventive step.

As long as the matter for which protection is sought is not clearly defined, the application of a complete problem-solution-approach is however not possible.

management of information associated with the various household users. In this frame, several proposals are already known, which are based on the use of control and supervision systems or devices for the household users, all of them characterized in that:

- they perform automatic activity, even if against an appropriate operation by the utilizer or customer for their starting configuration;
- they are classed at a hierarchical higher level compared to the household users level, i.e. developing an active control, with a *master* role, over them.

A fully alternative solution to such a "centralized" control and supervision approach of household users is disclosed in the European Patent Application EP-A-0 727 668, filed by the same Applicant hereto.

Such a document describes a set of household appliances capable of constantly receiving information concerning the total power absorption of all household users (household appliances, illumination system, air conditioning system, etc.), concerning the maximum usable power (power supply contract), the current time (clock function) and the likely different electricity cost according to variable use hours rates.

Such information are supplied by a special external sensor, which may be the same electric meter developed to that purpose, or an alternative device specifically provided. The means whereto such information are flowing may be of different type; however, the *power line* is a preferable one, i.e. the electric network itself, since there is no need for additional wiring.

The set of household appliances described in EP-A-0 727 668, each one equipped with a suitable electronic control system and adequate interfacing means to the network, is able to limit its own electric power consumption "spontaneously" and automatically, so as to maintain the total consumption of the whole household environment constantly below the limit established in the power supply agreement, requiring neither an external centralized supervision system nor any operation by the utilizer.

From US-A-4,602,340 a system is known, for distributing coded time or other information signals through the electrical gridwork of a facility such as a home, office, factory, or mobile vehicle, for purposes of information display and/or control and monitoring of equipment and activities thereof.

The present invention is based on the acknowledgment of the fact that in such a system of "smart" household appliances connected in a network, it would be useful for the utilizer and/or anybody charged with their maintenance to be informed of the operation status of the

CLAIMS

1. Method for monitoring electric users (C), in particular household appliances belonging to a same household environment and connected to a network (R), wherein at least an electric user (C) is provided, comprising an electronic control system having a microcontroller, memory means and interface means, said electronic control system being programmed for generating information which relate to operating conditions of the electric user (C), said information being made available outside said control system through said interface means, the method being characterized by the following steps:

- the electronic control system provides for generating diagnostic information, being representative of the efficiency status of components of the user (C) and/or statistical information, being representative of the wear status of components of the user (C),
- the electronic control system provides for storing, within said memory means, said information,
- the electronic control system provides for making the stored diagnostic and/or statistical information available outside said control system, through said interface means.

2. Method, according to claim 1, characterized in that said control system provides for updating in the time the diagnostic and/or statistical information stored within said memory means.

3. Method, according to claim 1, characterized in that said diagnostic information relate to the operation quality of said electric user (C), said operation quality being expressed through the value of a set of diagnostic parameters typical of the user (C).

4. Method, according to claim 1, characterized in that said statistical information relate to an history of the user (C) from a viewpoint of the performed operations and/or functions and/or usage procedures.

5. Method, according to claim 1 or 2, characterized in that the stored diagnostic and/or statistical information are made available through a monitoring device (F) which can communicate with said electronic control system through said interface means.

6. Method, according to claim 1, characterized in that said control system also

provides for generating functional information, being representative of the current operating status of the electric user (C).

7. Method, according to claim 5, characterized in that said control system provides for transmitting the stored diagnostic and/or statistical information on a network (R) and that said monitoring device (F), which is interfaced with said network (R), provides for selecting, picking up, organizing and making explicit the diagnostic and/or statistical information being transmitted on said network (R).

8. Method, according to claim 5 and 6, characterized in that said control system provides for transmitting said functional information on a network (R) and that said monitoring device (F), which is interfaced with said network (R), provides for selecting, picking up, organizing and making explicit the functional information transmitted on said network (R).

9. Method, according to at least one of the previous claims, characterized in that said monitoring device (F) provides for storing and/or updating within its own memory means (ME) the information picked up from said network (R), before making them explicit.

10. Method, according to at least one of the previous claims, characterized in that said diagnostic and/or statistical and/or functional information are made explicit within the household environment.

12. Method, according to at least one of the previous claims, characterized in that at least said diagnostic and/or statistical information are made explicit or transmitted outside the household environment.

13. Method, according to claim 12, characterized in that said diagnostic and/or statistical information are transmitted to a service and/or preventive maintenance center (H) for said electric user (R).

14. Method, according to at least one of the previous claims, characterized in that the selection is provided of the type of information to be made explicit through said monitoring device (F).

15. Method, according to at least one of the previous claims, characterized in that the selection is provided of the transmission procedure for said diagnostic and/or statistical information at remote level.

16. Method, according to claim 13, characterized in that the service activity of said center (H) is based on said diagnostic information.

17. Method, according to claim 13, characterized in that the preventive maintenance activity of said center (H) is based at least on said statistical information.

18. Method, according to the claim 13, characterized in that the transmission of said diagnostic and/or statistical information to said center (H) is realized through a telephone line.

19. Method, according to the claim 13, characterized in that the transmission of said diagnostic and/or statistical information to said center (H) is realized through Internet.

20. System for monitoring electric users (C), in particular household appliances belonging to a same household environment and connected to a network (R), wherein at least an electric users (C) is provided, comprising an electronic control system having a microcontroller, memory means and interface means, said electronic control system being programmed for generating information which relate to operating conditions of the electric user (C), said information being made available outside said control system through said interface means, characterized in that said electronic control system is programmed for generating and storing within said memory means at least diagnostic information, being representative of the efficiency status of components of the user (C) and/or statistical information, being representative of the wear status of components of the user (C), and that means (F) are provided for making the stored diagnostic and/or statistical information available outside said control system, through said interface means.

21. System, according to claim 20, characterized in that said means comprises said electronic control system of said electric user, being programmed for that purpose.

22. System, according to claim 20, characterized in that said means comprises a monitoring device (F) capable of communicating with said electronic control system

through said interface means.

23. System, according to claim 20, characterized in that said control system is programmed for updating in the time the diagnostic and/or statistical information stored within said memory means.

24. System, according to claim 20, characterized in that said diagnostic information relate to the operation quality of said electric user (C), said operation quality being expressed through the value of a set of diagnostic parameters typical of the user (C).

25. System, according to claim 20, characterized in that said statistical information relate to an history of the user (C) from a viewpoint of the performed operations and/or functions and/or the usage procedures.

26. System, according to claim 20, characterized in that said control system is also programmed for generating functional information, being representative of the current operating status of the electric user (C).

27. System, according to claim 22, characterized in that said monitoring device (F) comprises means (N,I,MP,V,K,L,M) for selecting, picking up, organizing and making explicit the stored diagnostic and/or statistical information.

28. System, according to claim 22, characterized in that said control system is programmed for transmitting the stored diagnostic and/or statistical information on a network (R) and that said monitoring device (F) is interfaced with said network (R).

29. System, according to claims 27 and 28, characterized in that said monitoring device (F) comprises its own memory means (ME) for storing the diagnostic and/or statistical transmitted on said network (R).

30. System, according to claim 27, characterized in that said monitoring device (F) comprises a display device (V).

31. System, according to claim 27, characterized in that said monitoring device (F) comprises transmission means (L,M), for transmitting said stored information to a remote site, in particular through Internet.

32. System, according to claim 30, characterized in that said monitoring device (F)

comprise interaction means (K) for selecting the type of information to be displayed on said display device (V).

33. System, according to claim 31, characterized in that said monitoring device (F) comprise interaction means (K) for activating the transmission of said stored information.

34. System, according to claim 31, characterized in that said transmission means (L,M) comprise a modem.

35. An electric user, in particular a household appliance, for the use in the method according to any of claims 1 to 19 or the system according to any of claims 20 to 34 comprising an electronic control system having a microcontroller, memory means and interface means, said electronic control system being programmed for generating and storing within said memory means at least diagnostic information, being representative of the efficiency status of components of the user (C) and/or statistical information, being representative of the wear status of components of the user (C), and means for making the stored information available outside said control system, through said interface means.

36. A monitoring device, for the use in the method according to any of claims 1 to 19 or the system according to any of claims 20 to 34 comprising:

- interface means (I);
- means for selecting (V,L,M,R,K,MP), picking up (N), organizing and making explicit said stored diagnostic and/or statistical information.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
ME010		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/IB 99/00302	18/02/1999	20/02/1998
Applicant		
MERLONI ELETTRODOMESTICI S.P.A. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

[ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

[ ] contained in the international application in written form.

[ ] filed together with the international application in computer readable form.

[ ] furnished subsequently to this Authority in written form.

[ ] furnished subsequently to this Authority in computer readble form.

[ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

[ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

[X] the text is approved as submitted by the applicant.

[ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

[X] the text is approved as submitted by the applicant.

[ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

[X] as suggested by the applicant.

[ ] None of the figures.

[ ] because the applicant failed to suggest a figure.

[ ] because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/00302

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H02J13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H02J G05B G05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 727 668 A (MERLONI ELETTRODOMESTICI SPA) 21 August 1996 cited in the application see the whole document	1-46
A	US 4 602 340 A (APPELBERG GUSTAF T) 22 July 1986 see the whole document	1-46
A	EP 0 727 860 A (BOSCH SIEMENS HAUSGERAETE) 21 August 1996 see abstract	1-6,13, 24-26, 31,32
A	EP 0 040 689 A (MICROTEC ELECTRONIC GMBH) 2 December 1981 see the whole document	1,24-26, 31

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 May 1999	07/06/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Moyle, J

1

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 644 320 A (CARR R STEPHEN ET AL) 17 February 1987 see the whole document	17,22,23
A	PATENT ABSTRACTS OF JAPAN vol. 096, no. 007, 31 July 1996 & JP 08 079987 A (N T T INTELLIGENT KIKAKU KAIHATSU KK), 22 March 1996 see abstract	25

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/IB 99/00302

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0727668 A	21-08-1996	IT T0950119 A	20-08-1996
US 4602340 A	22-07-1986	NONE	
EP 0727860 A	21-08-1996	DE 19505677 A	22-08-1996
EP 0040689 A	02-12-1981	DE 3020099 A	03-12-1981
US 4644320 A	17-02-1987	NONE	